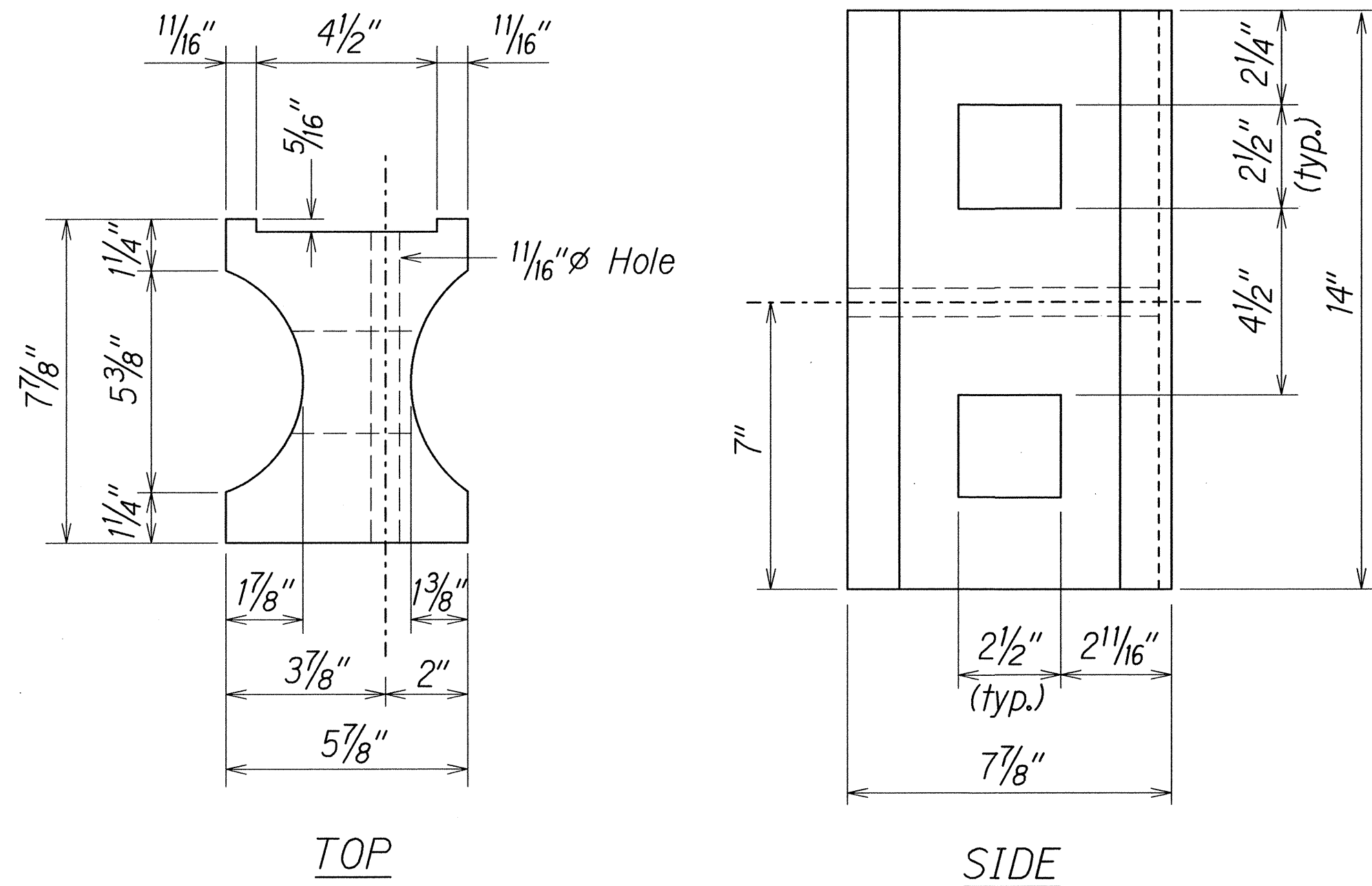
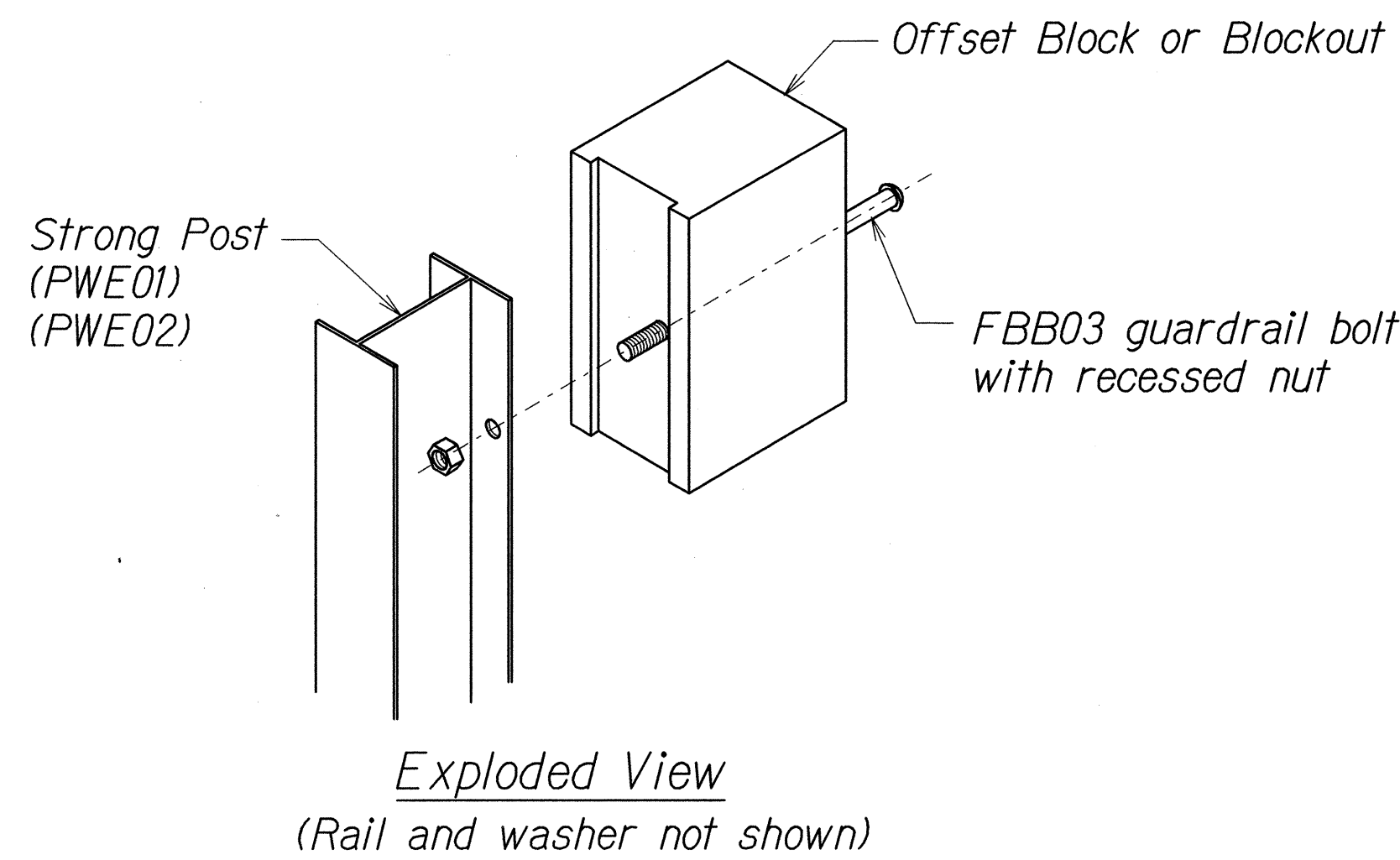


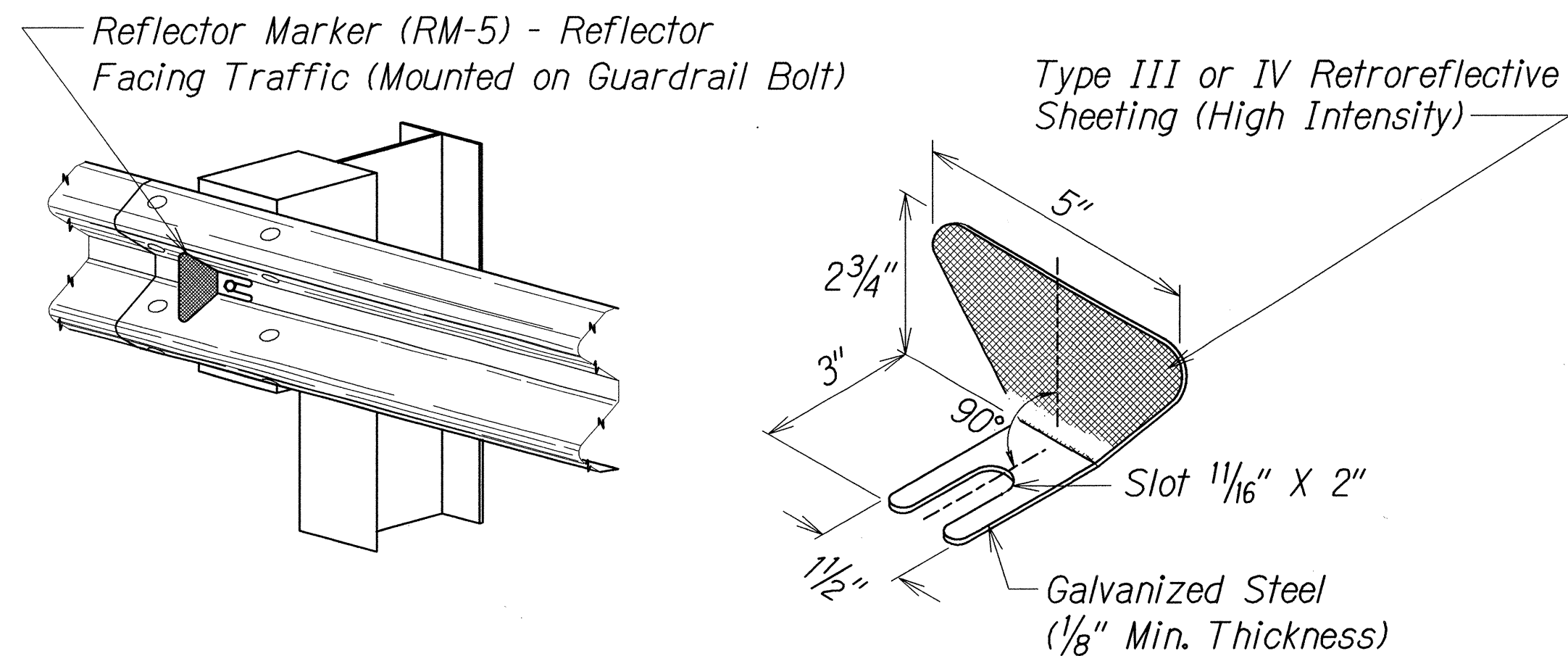
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(056)	2013	19	85



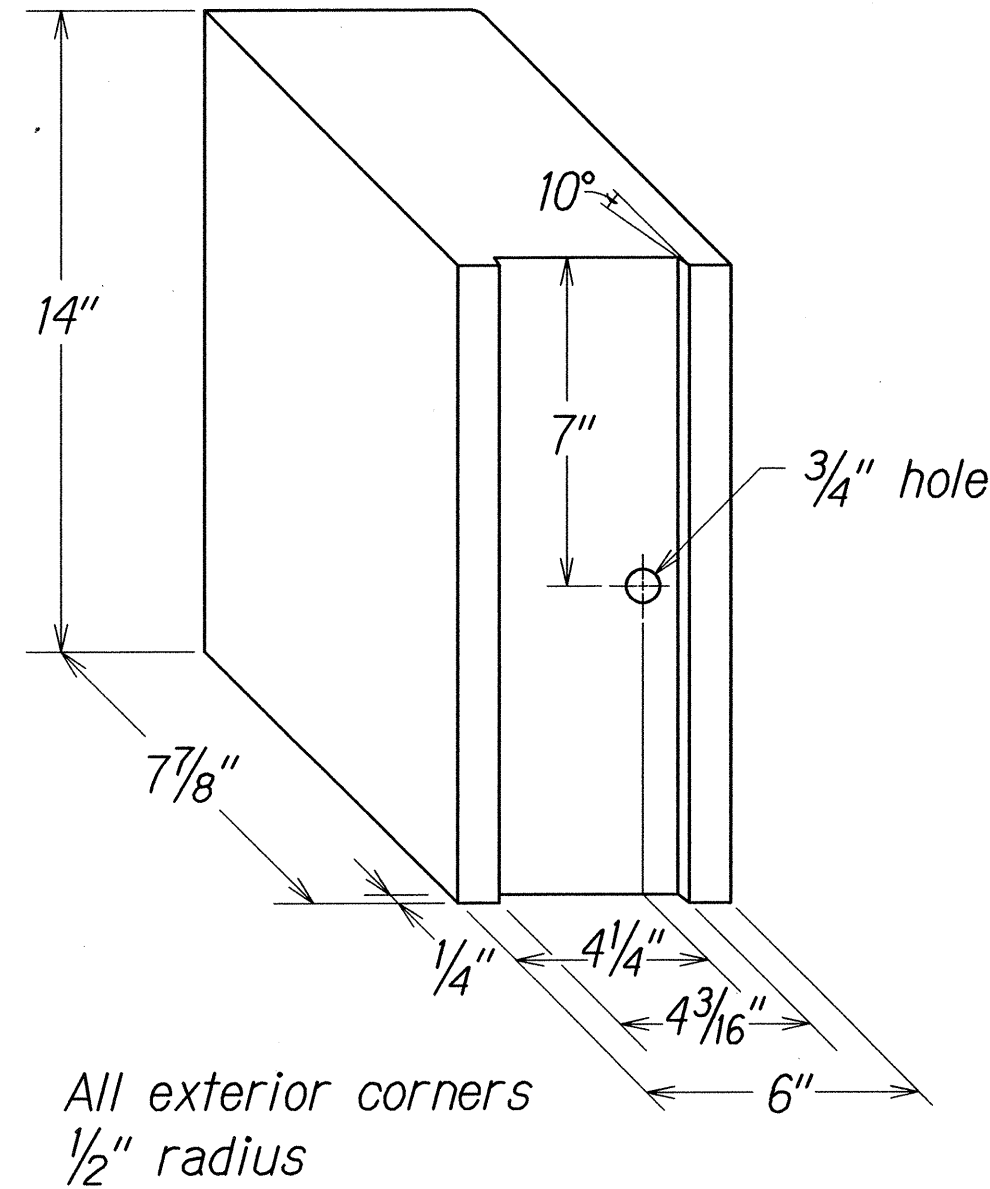
RECYCLED PLASTIC BLOCKOUT (TYPE I)



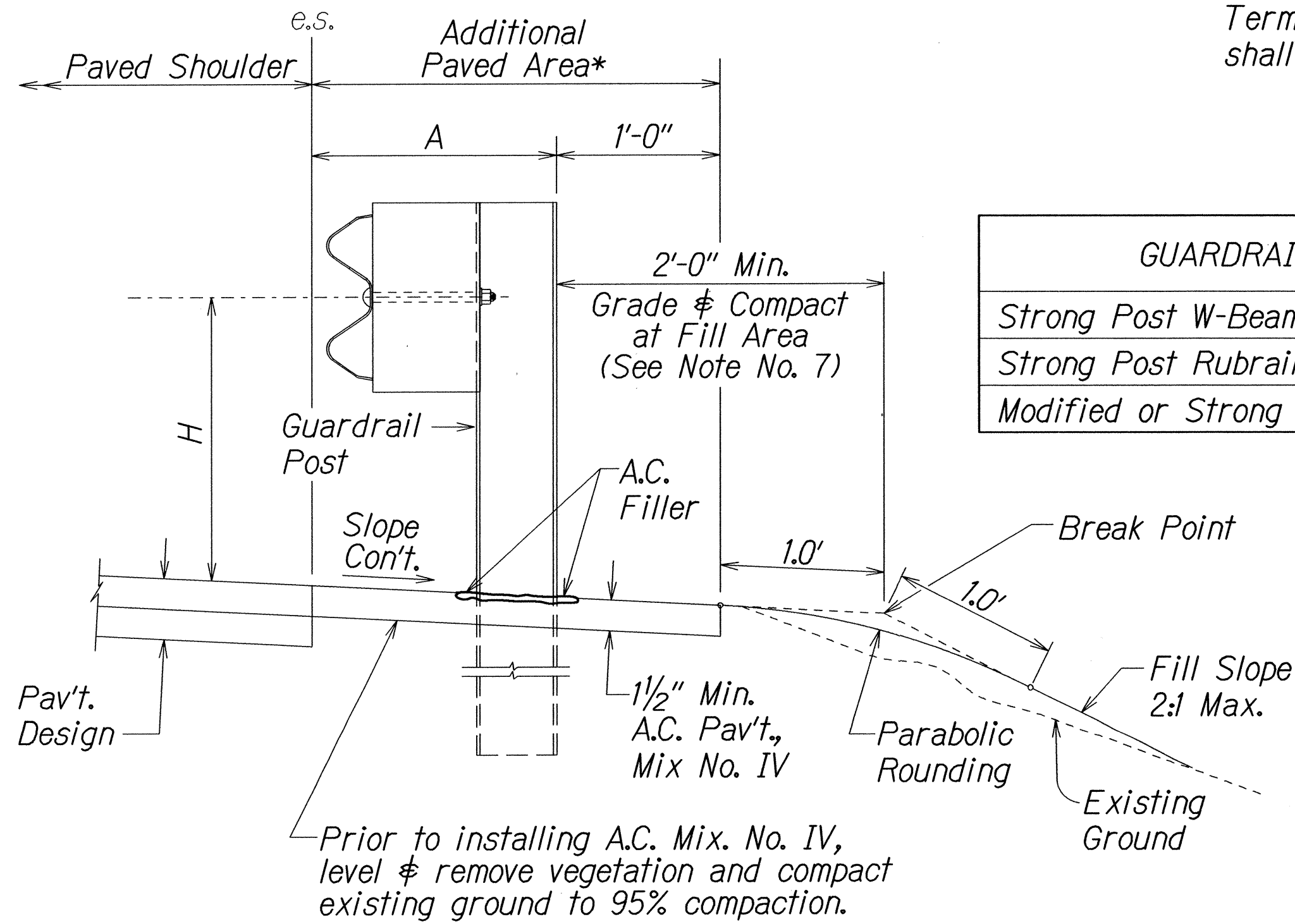
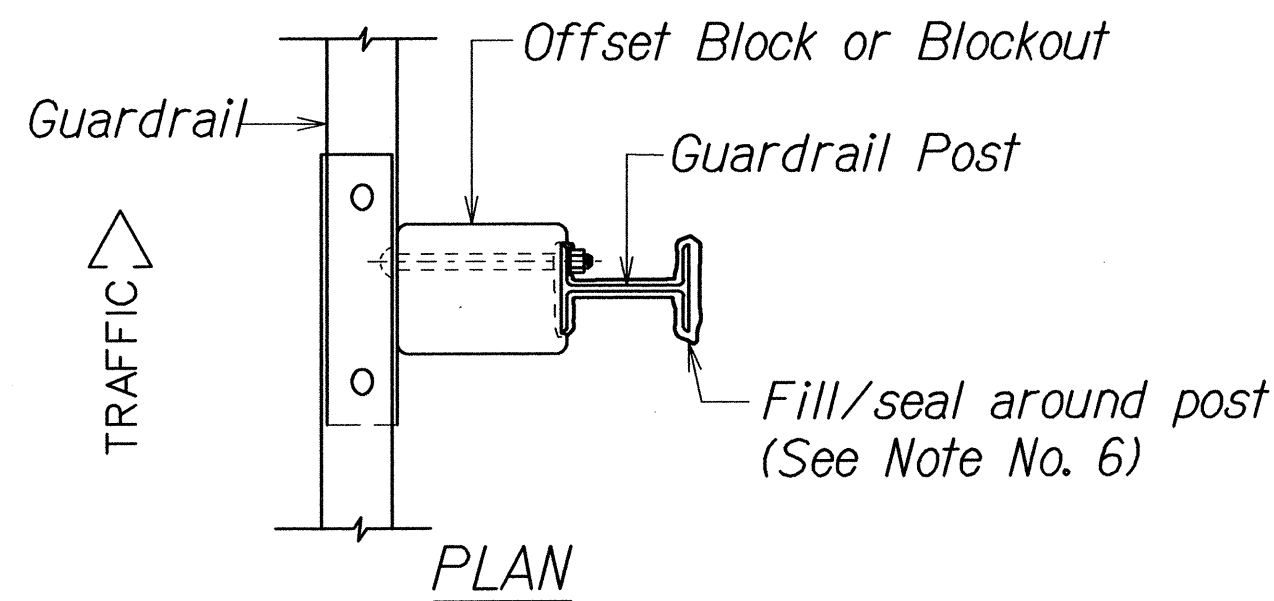
STEEL POST AND BLOCK DETAIL



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION



RECYCLED POLYETHYLENE OFFSET BLOCK (TYPE II)



ELEVATION

TYPICAL GUARDRAIL INSTALLATION

GENERAL NOTES

- All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
- Where conditions require, special post lengths in increments of 6 inches may be specified.
- All fasteners, posts, and rail elements (i.e. FBB03, PWE01, RWM02b, etc.) shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware", a report prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Subcommittee On New Highway Materials, Task Force 13 Report. Dimensions of fastners, posts and rail elements have been converted from metric units into their present form.
- The Recycled Plastic Block or Offset Block shall be approved by the State.
- All new guardrail systems (system consists of total length of guardrail including both end treatments) shall include the Additional Paved Area.
- After the guardrail posts are installed in the paved area, the Contractor shall fill/seal around each guardrail post and all cracks in the paved area caused during the guardrail post installation. If required by the inspector/engineer, the Contractor shall tamper the paved area around the guardrail post prior to filling/sealing. All costs associated with this work shall not be paid for separately, but shall be considered incidental to the various guardrail items.
- When standards for the fill slope area cannot be met, a site specific, engineer approved design may be used.
- Reflector Markers (RM-5) mounted on guardrails shall be spaced every 25 feet. RM-5's shall not be installed on Terminal Sections. Furnishing and installing of each RM-5 shall be considered incidental to the adjacent guardrail system.

GUARDRAIL TYPE	DIMENSION	
	H	A
Strong Post W-Beam	1'-9 5/8"	1'-6"
Strong Post Rubrail (W-Beam)	2'-0"	1'-6"
Modified or Strong Post Thrie Beam	2'-0"	2'-0"

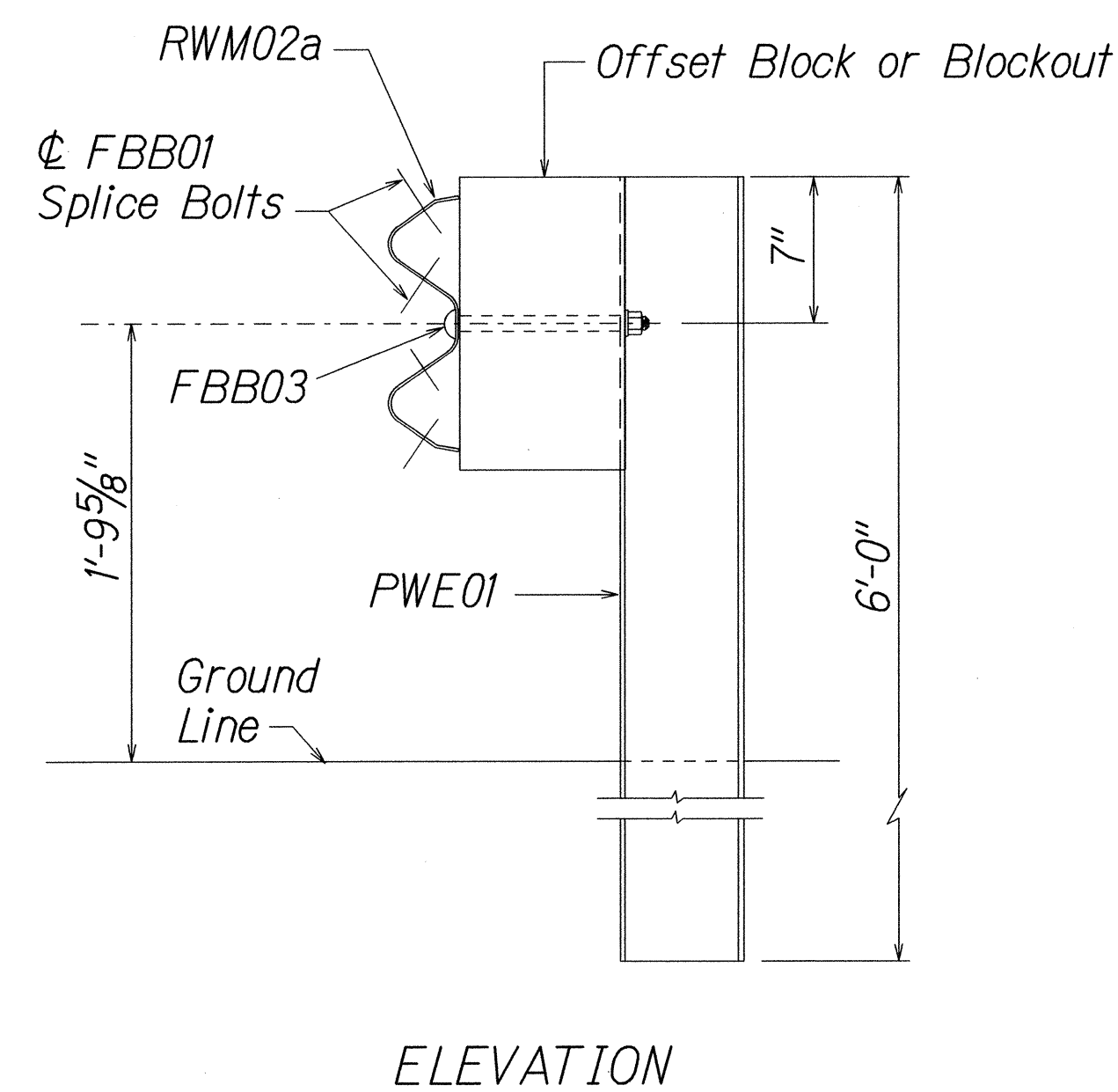
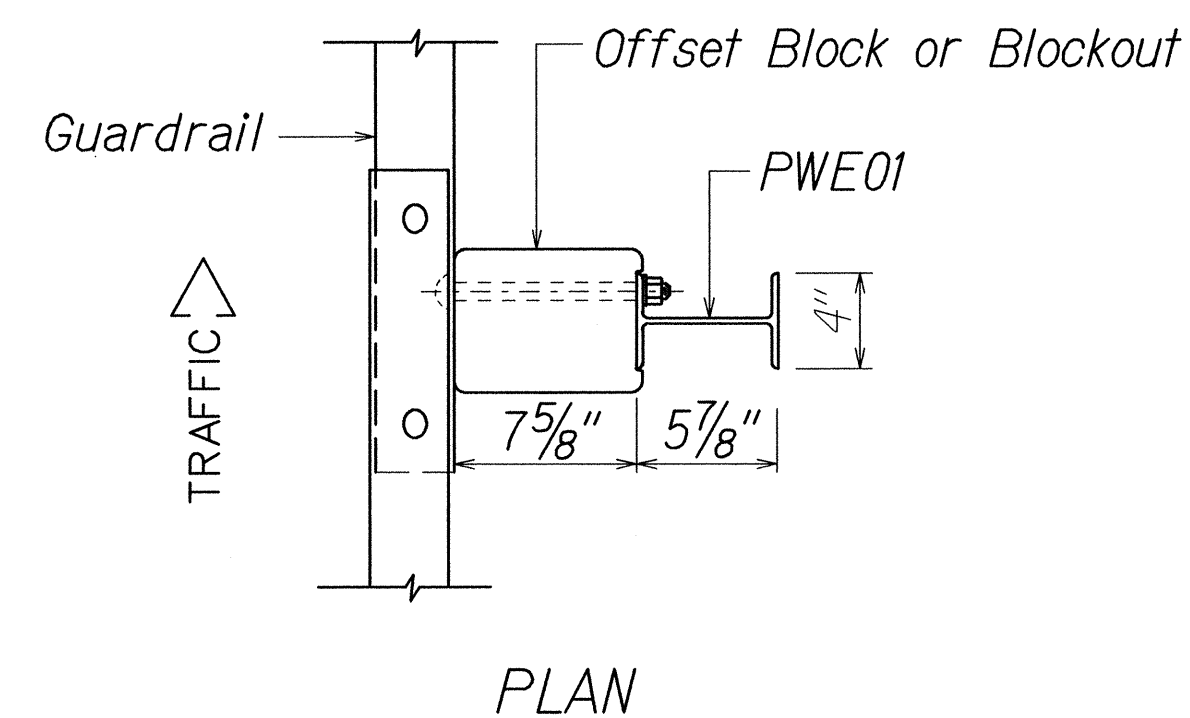
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL DETAILS & NOTES
KALANTANAOLE HIGHWAY RESURFACING
West Hind Drive to
Vicinity of Hanauma Bay Road
Federal Aid Project No. NH-072-1(056)
Scale: NTS
Date: August, 2013

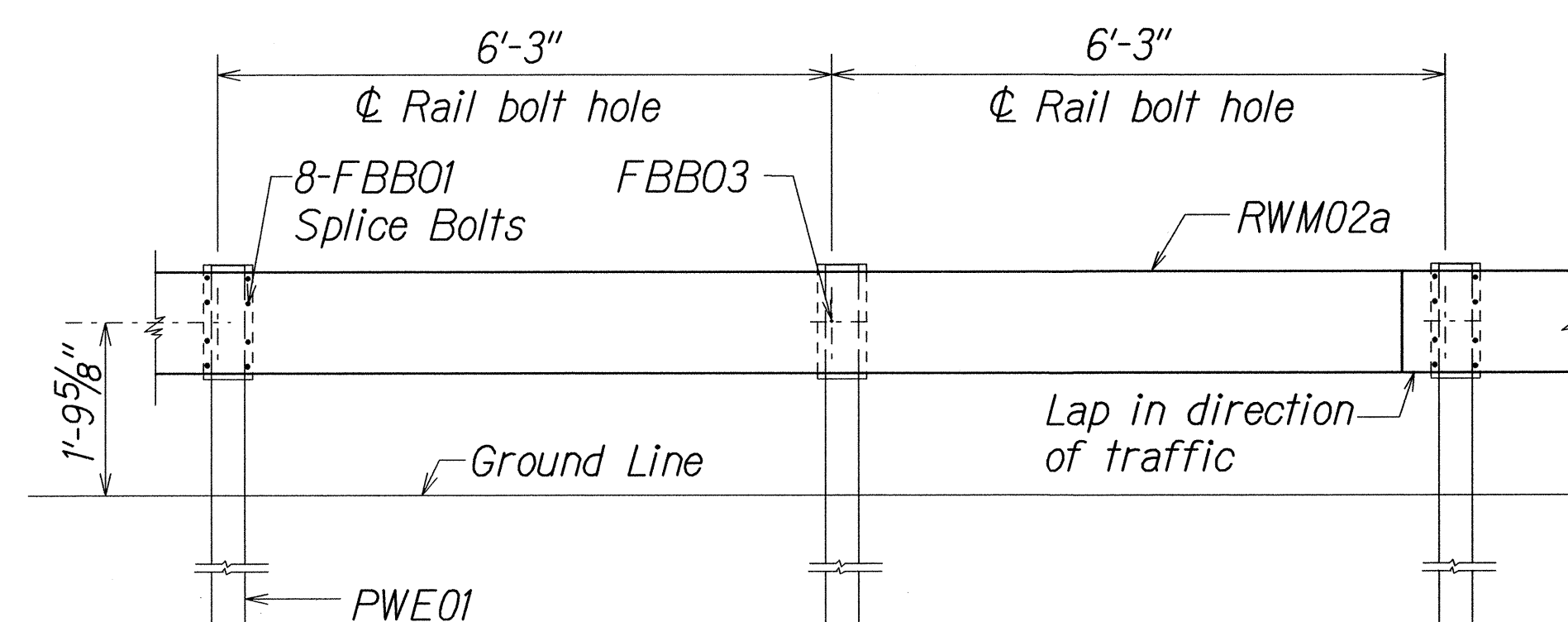
SHEET No. 1 OF 5 SHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(056)	2013	20	85

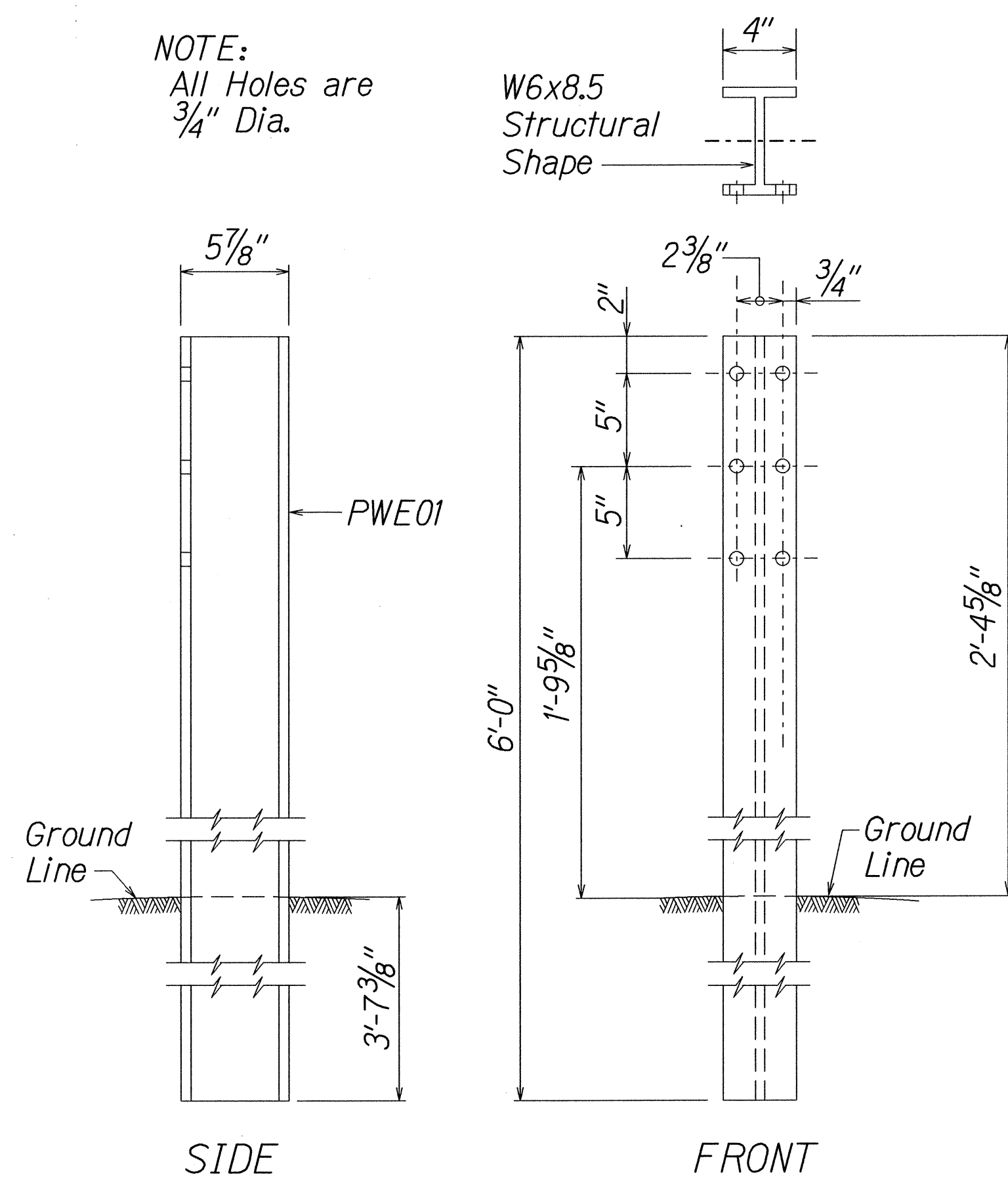


STRONG POST W-BEAM GUARDRAIL
(SGR04a)

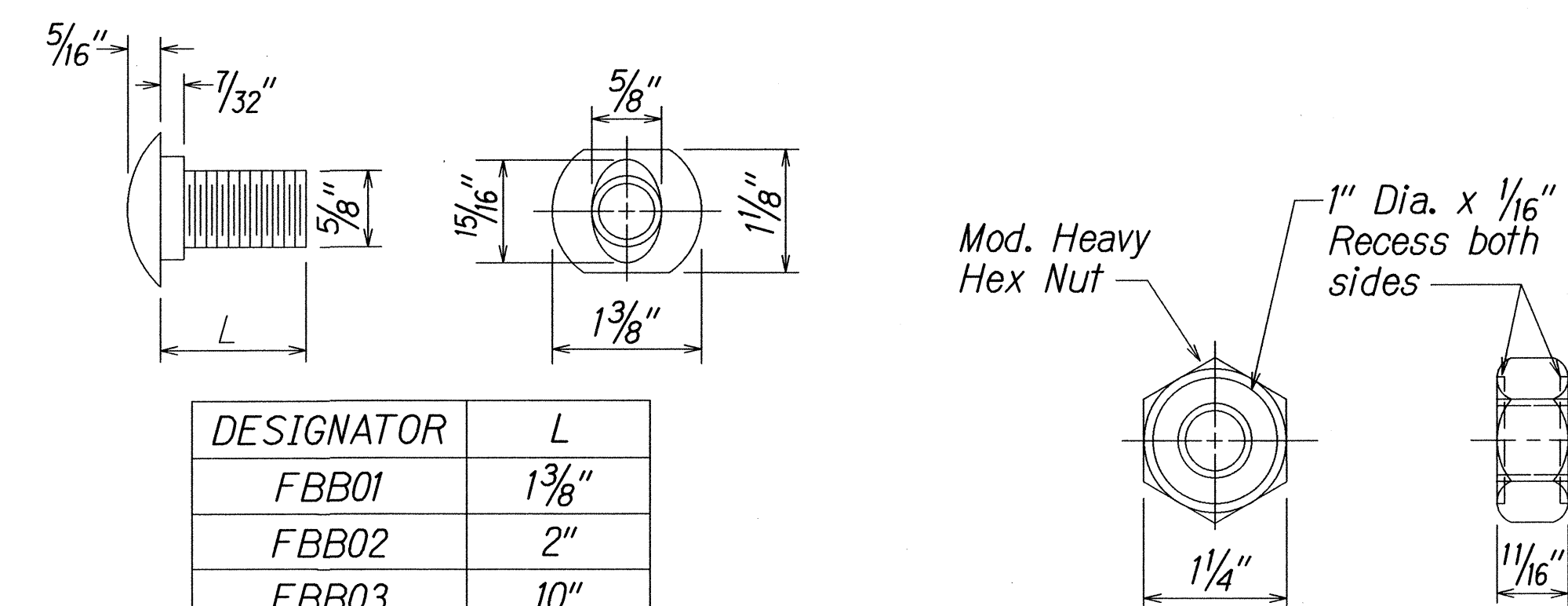


STRONG POST W-BEAM GUARDRAIL WITH
RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT

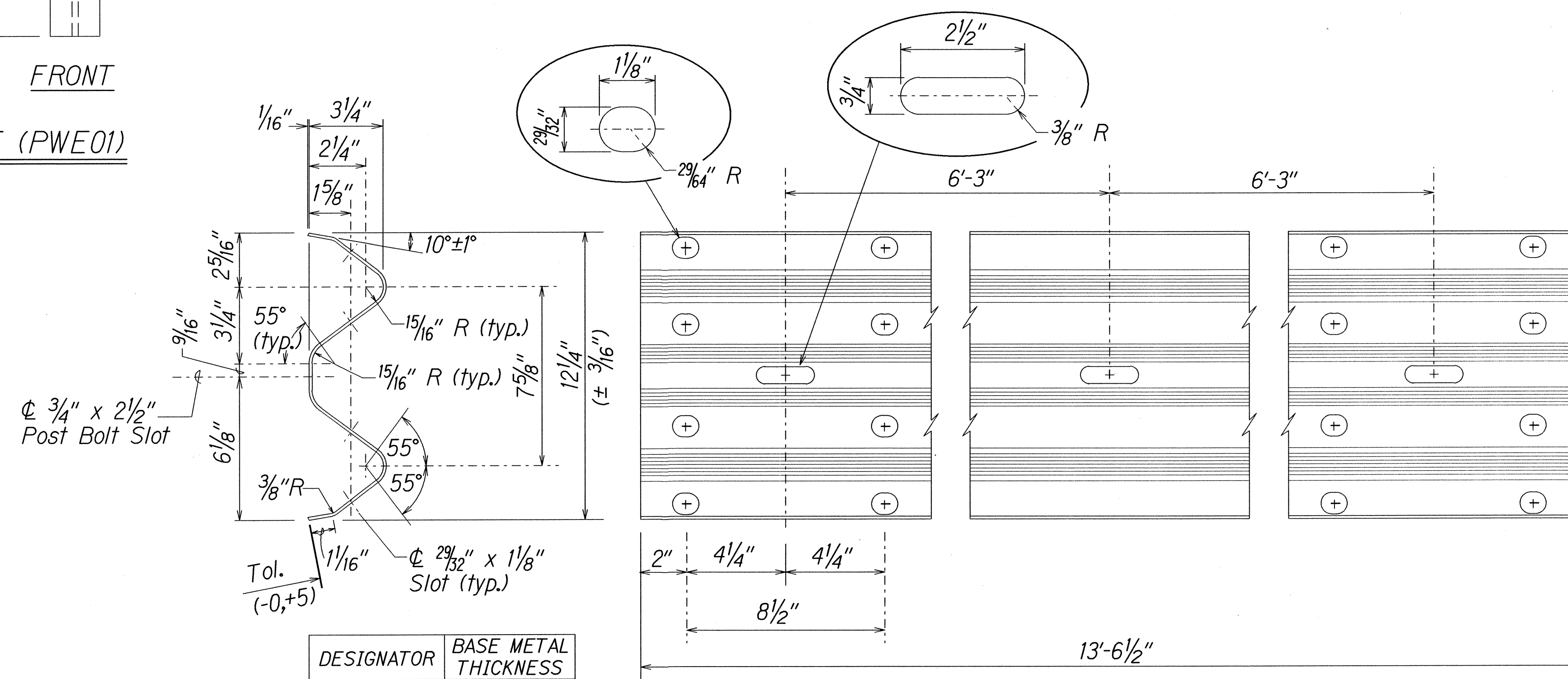
NOTE:
All Holes are
3/4" Dia.



W-BEAM STRONG POST (PWE01)



GUARDRAIL BOLTS AND RECESSED NUT



2 SPACE W-BEAM GUARDRAIL (RWM02a)

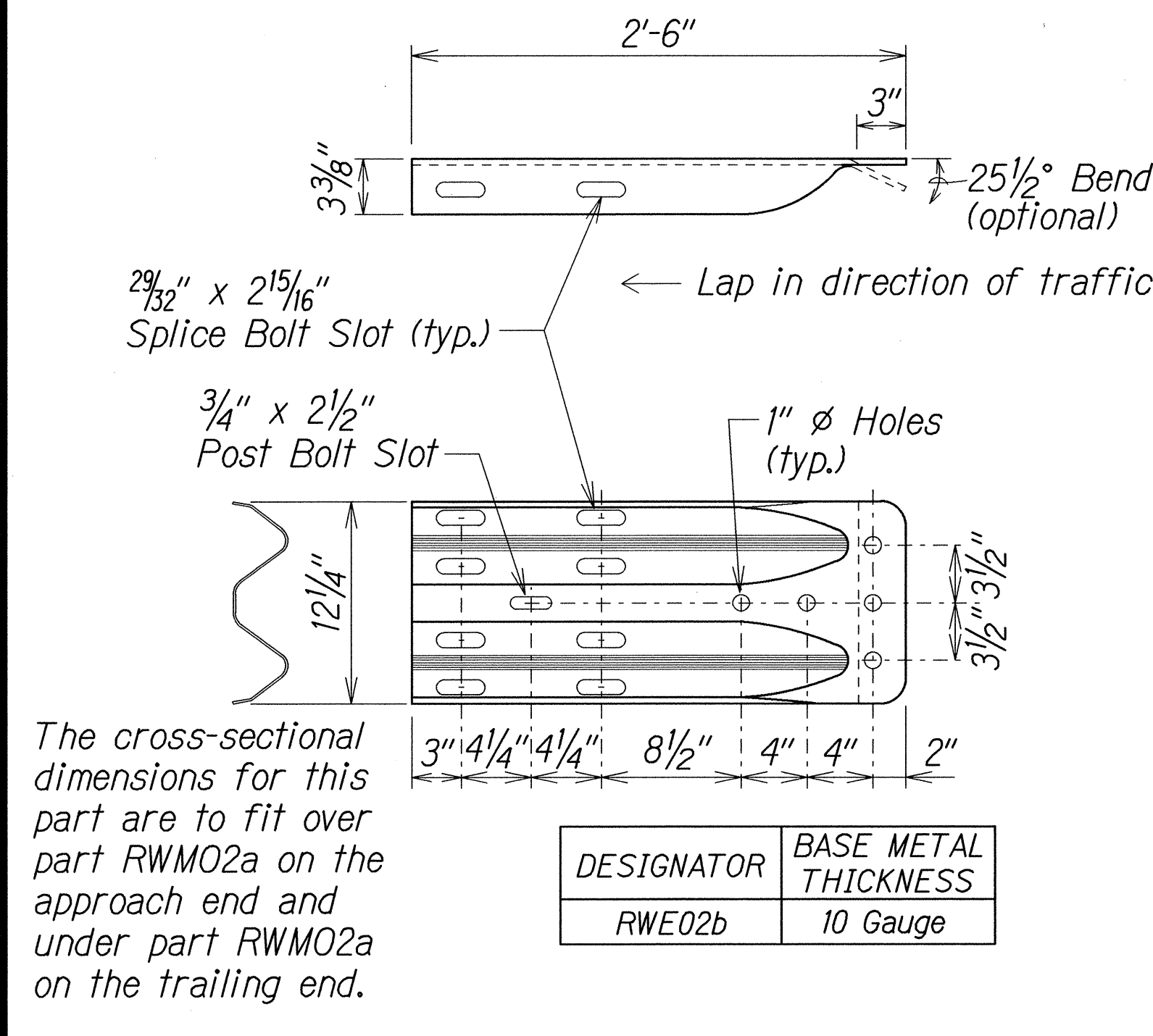
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRONG POST W-BEAM GUARDRAIL
KALANIANA'OLE HIGHWAY RESURFACING

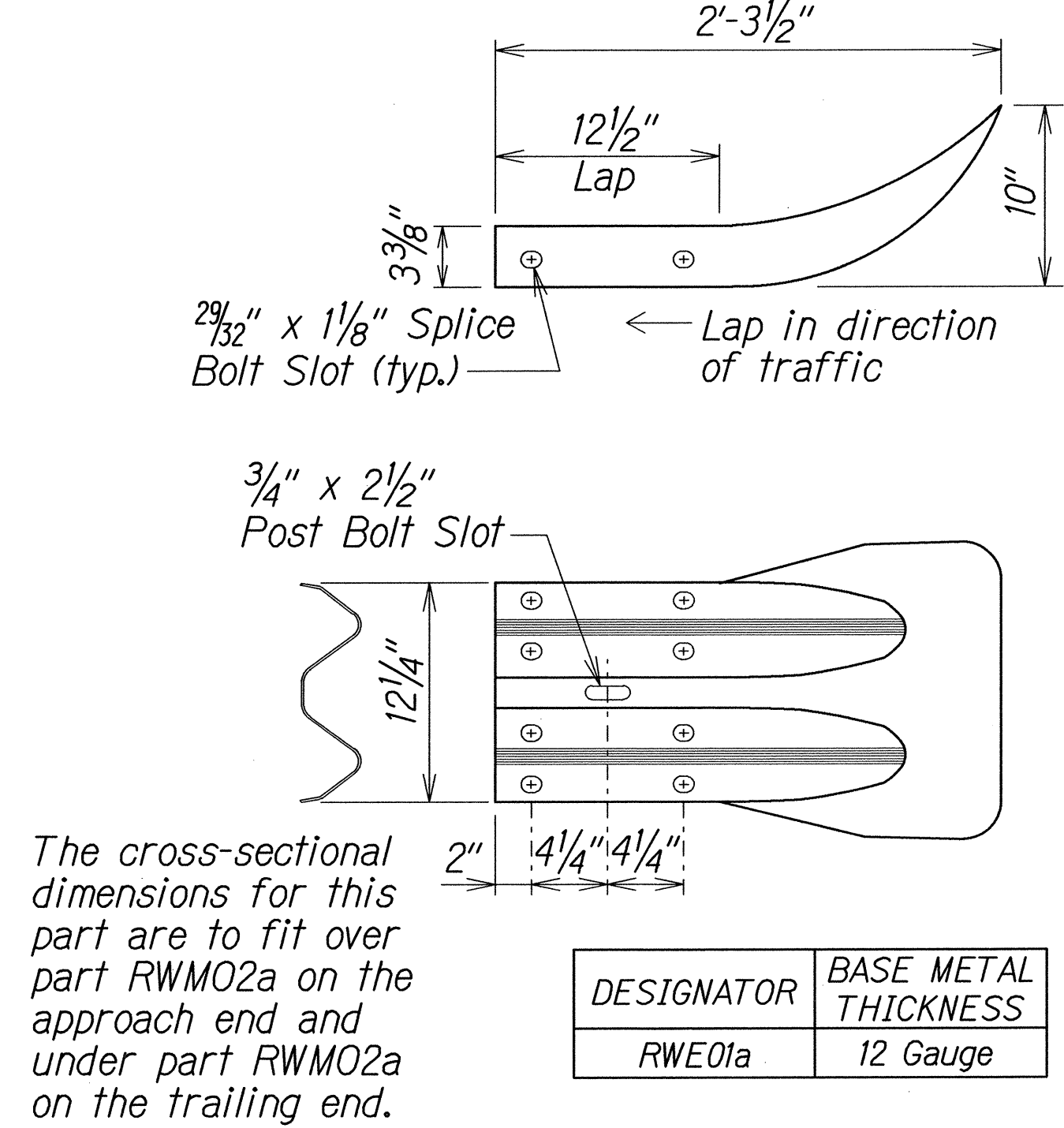
West Hind Drive to
Vicinity of Hanauma Bay Road
Federal Aid Project No. NH-072-1(056)
Scale: NTS Date: August, 2013

SHEET No. 2 OF 5 SHEETS

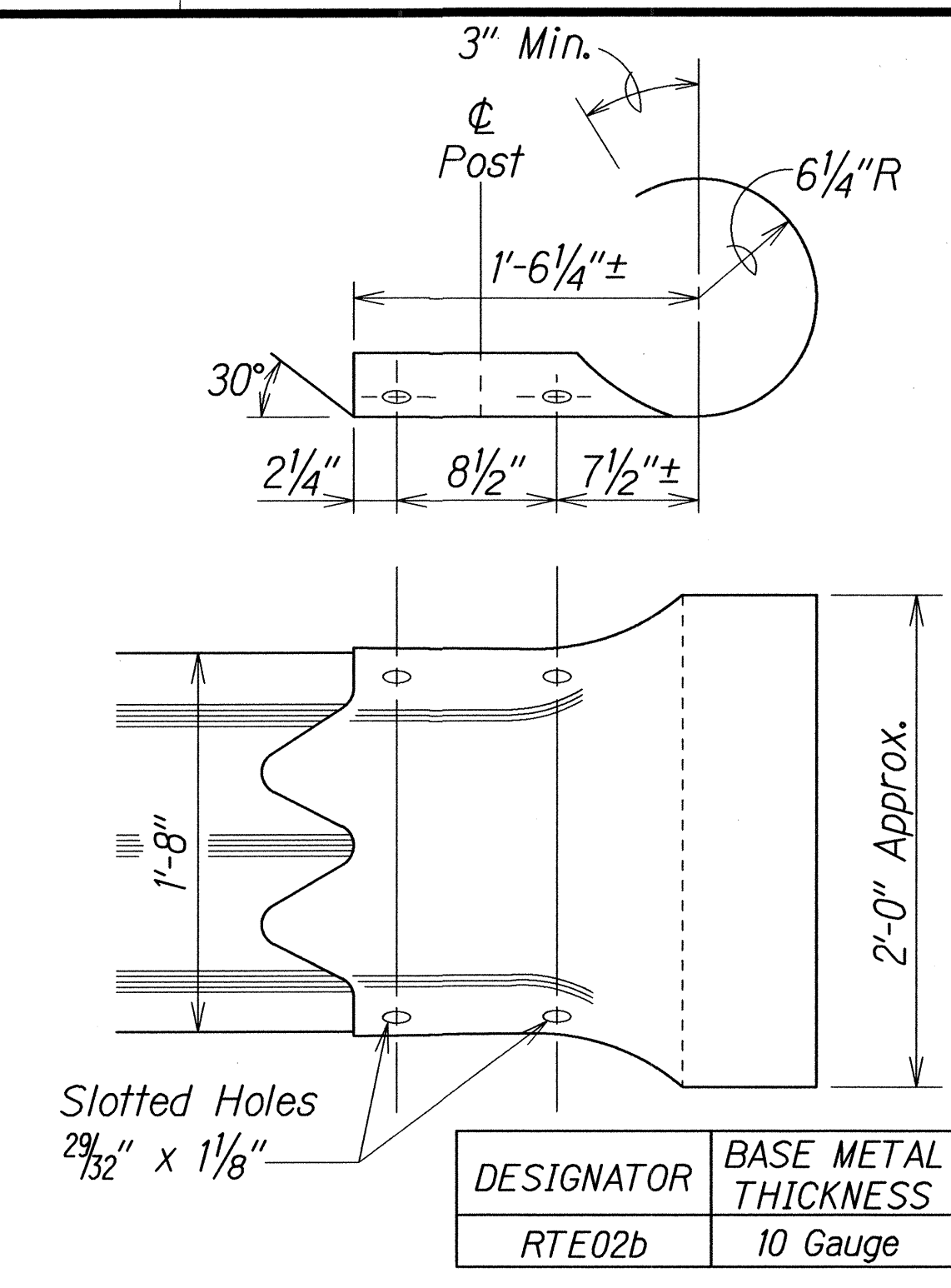
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HAWAII	HAW.	NH-072-1(056)	2013	21	85



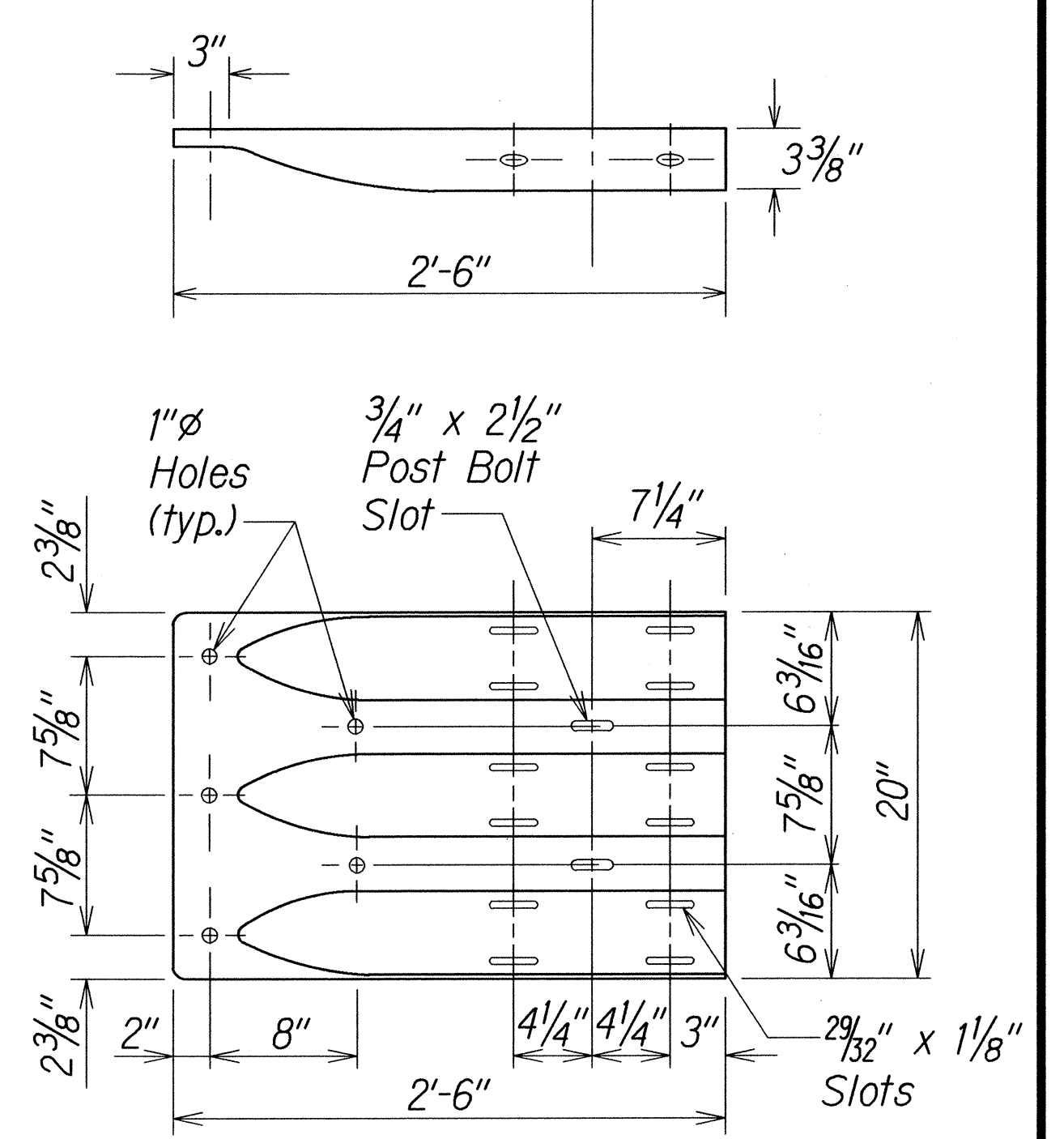
W-BEAM TERMINAL CONNECTOR (RWE02b)



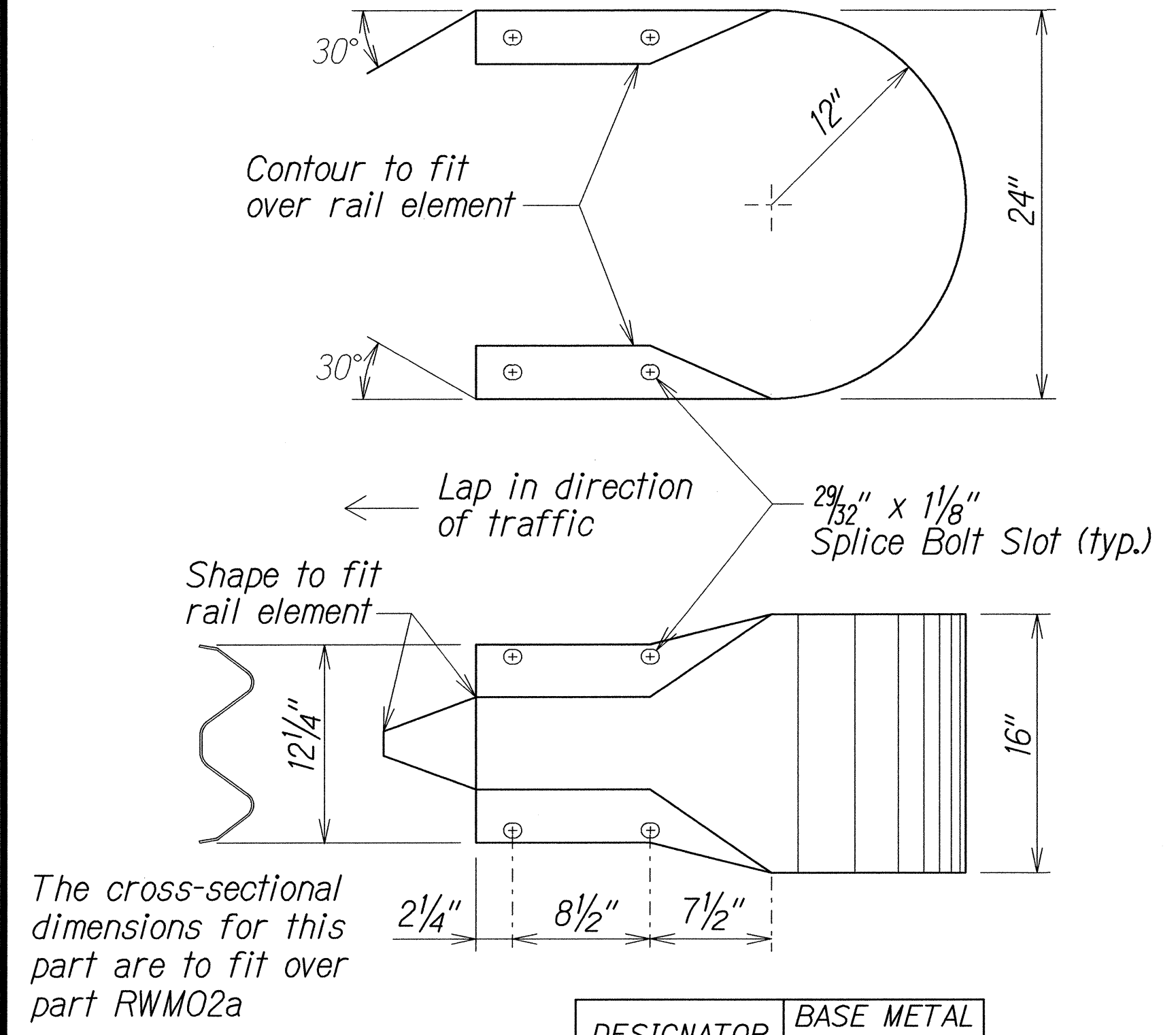
W-BEAM END SECTION (FLARED RWE01a)



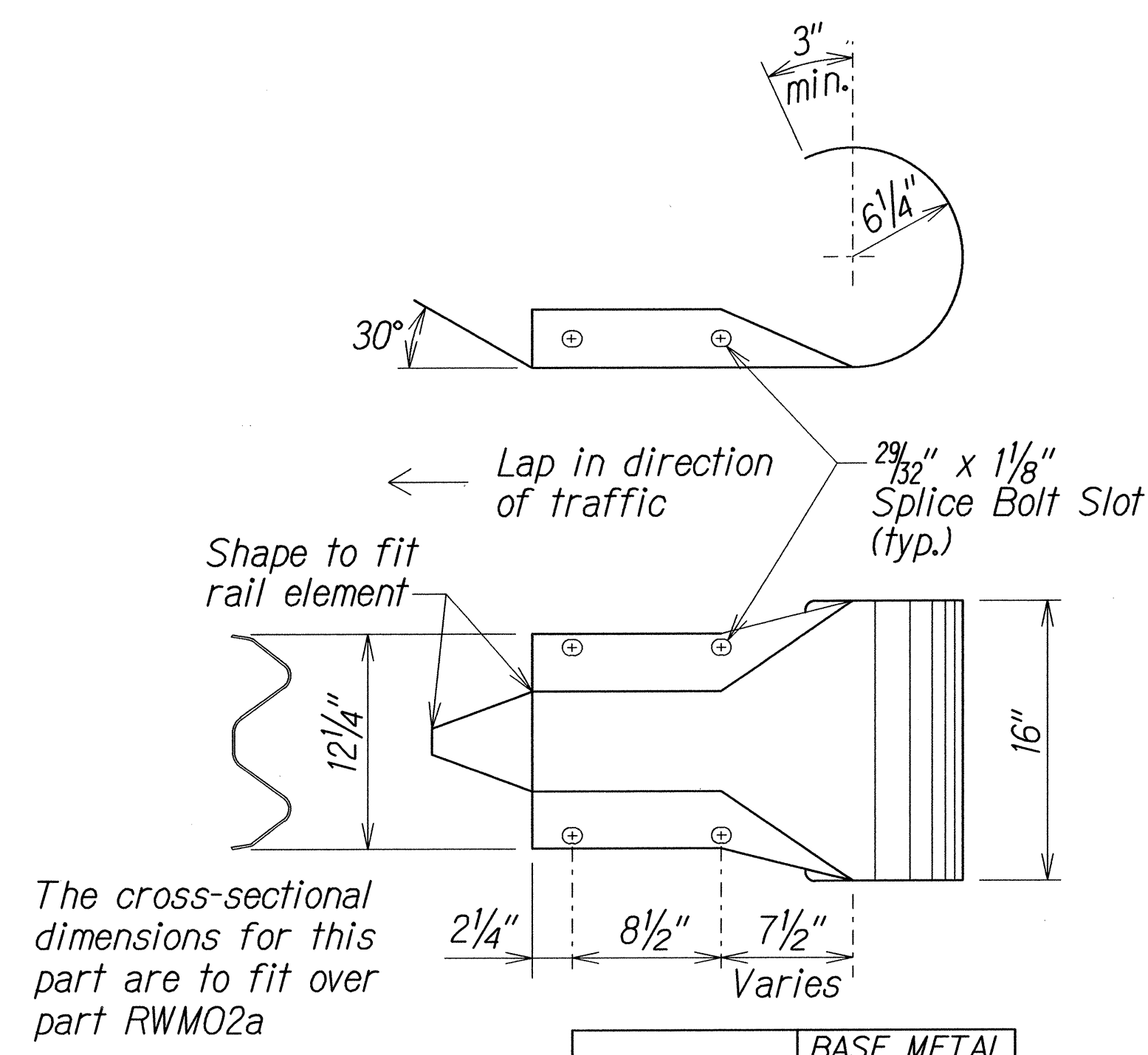
THRIE-BEAM SECTION (ROUNDED) (RTE02b)



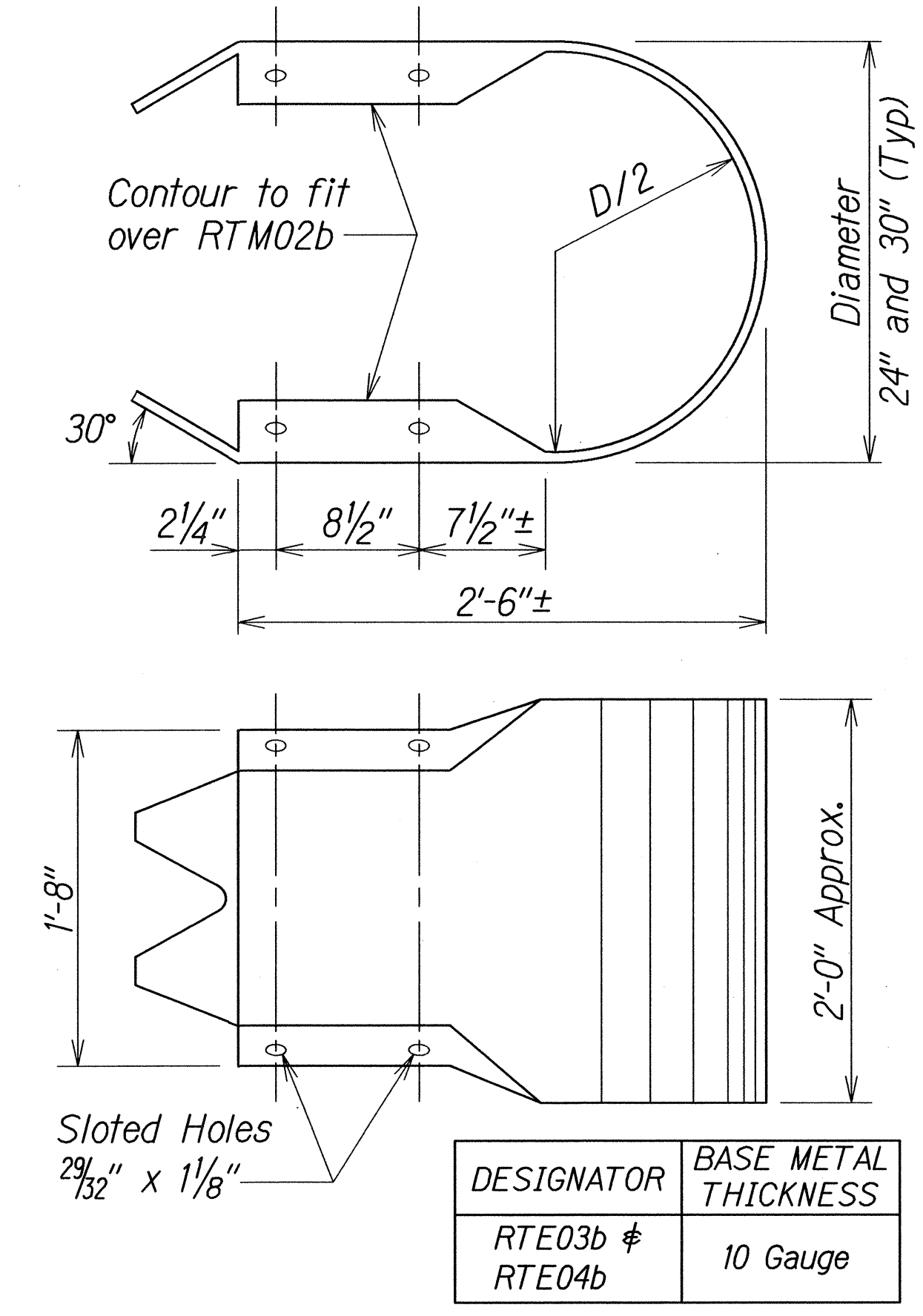
THRIE-BEAM TERMINAL CONNECTOR (RTE01b)



W-BEAM END SECTION (BUFFER RWE06a)



W-BEAM END SECTION (ROUNDED RWE03a)



THRIE-BEAM END SECTION (BUFFER RTE03b or RTE04b)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARDRAIL TERMINAL CONNECTORS AND END SECTIONS

KALANIANA'OLE HIGHWAY RESURFACING

West Hind Drive to
Vicinity of Hanauma Bay Road

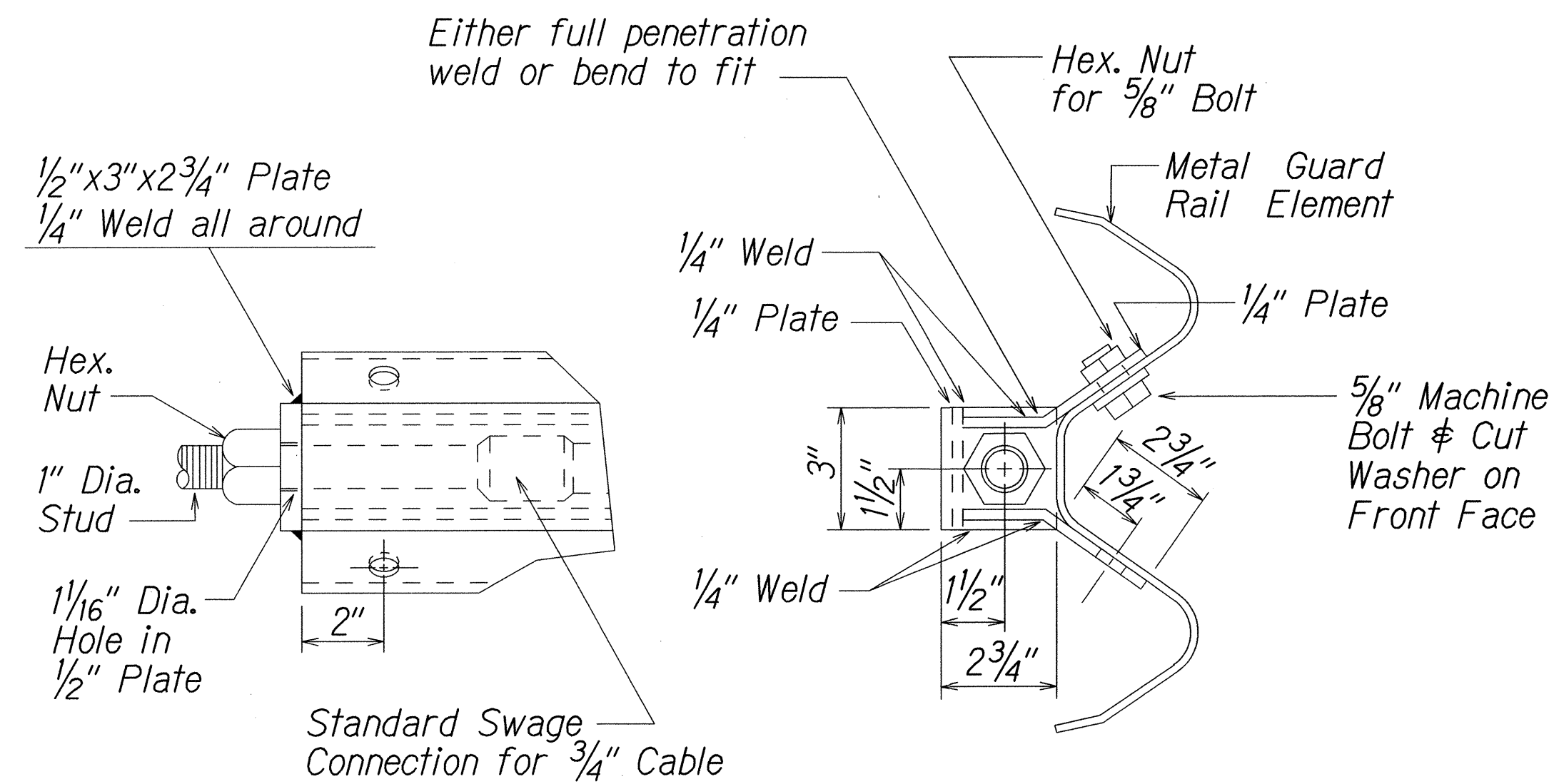
Federal Aid Project No. NH-072-1(056)

Scale: NTS Date: August, 2013

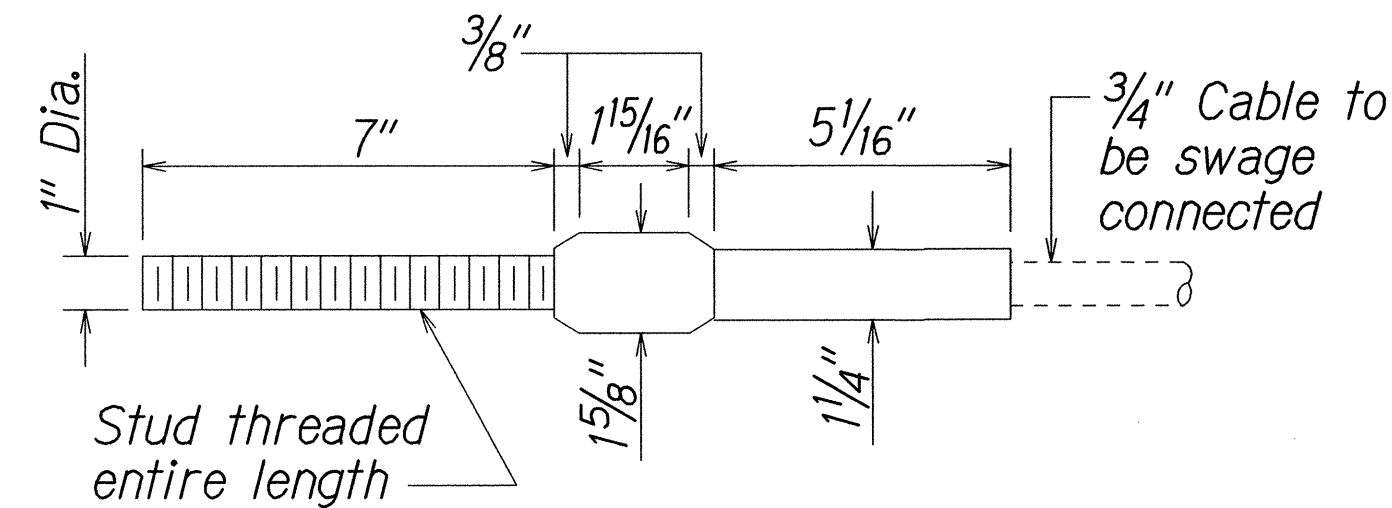
SHEET No. 3 OF 5 SHEETS

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CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
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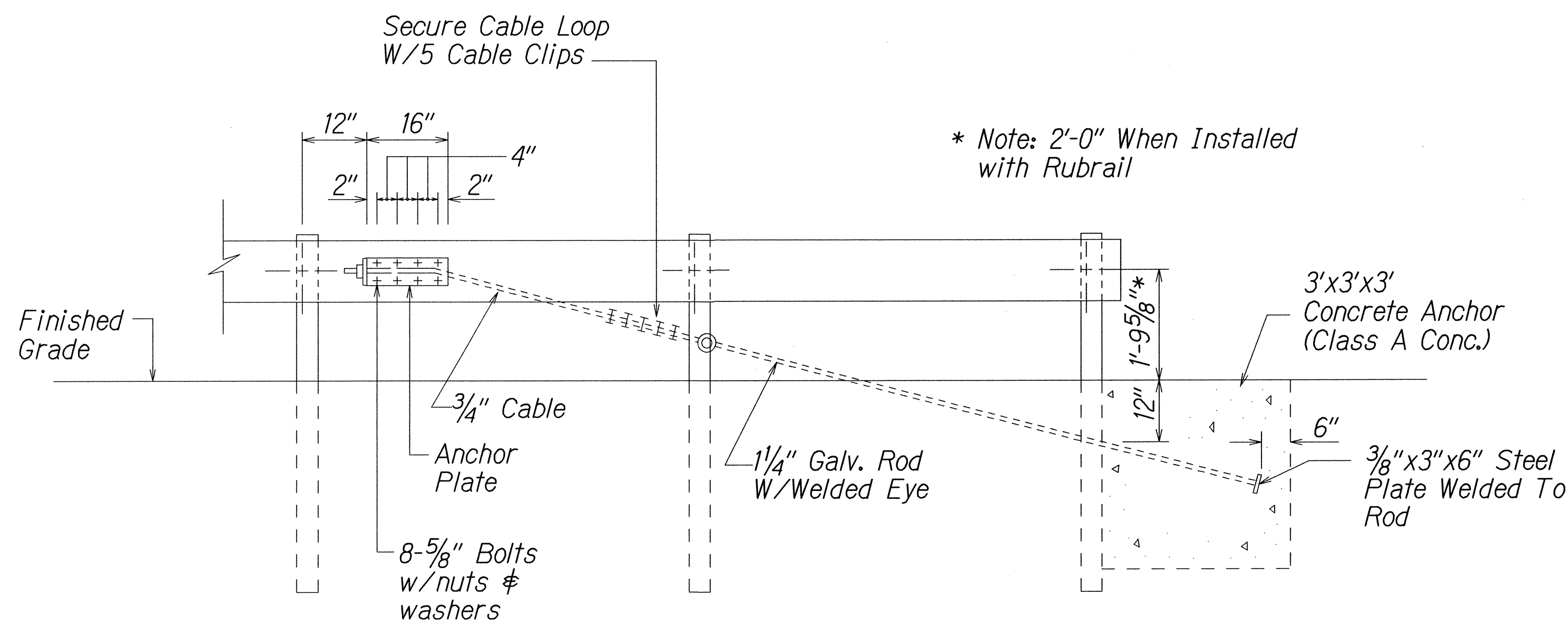
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(056)	2013	22	85



ANCHOR PLATE DETAILS

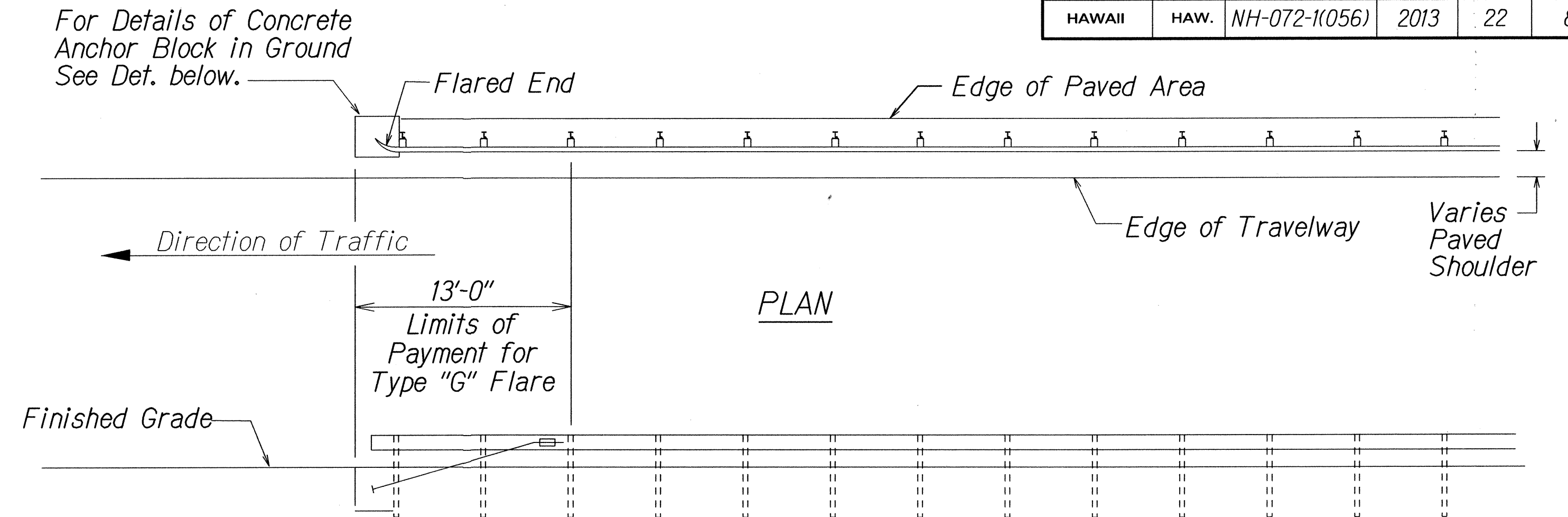


STANDARD SWAGED FITTING AND STUD



ANCHOR BLOCK DETAIL

- Concrete, G.R.P., excavation, anchor rod and miscellaneous appurtenances necessary to anchor the guardrail ends shall be incidental to metal guardrail.



ELEVATION

TYPE "G" FLARE END TERMINAL

NOTE:

Type "G" Modified End Terminal is a site specific end terminal with a taper and radial termini. A site specific detailed drawing is required for all Type "G" Modified End Terminal and must receive Engineer's approval.

The taper (flare rate) of the guardrail shall follow the latest edition of AASHTO'S Roadside Design Guide (currently, Table 5.6 - Suggested Flare Rate for Barrier Design, page 5-21, Jan. 1996 edition).

The radius of the radial termini is an Engineer's judgement based on the site evaluation. The Engineer shall consider safety (minimize the spearing & blunt end situation); degree and potential seriousness of the hazard; bicycle and pedestrian accessibility; maintenance equipment accessibility; Right-of-Way availability; the smallest radii the metal w-beam/thrie-beam railing can be constructed (check with supplier/contractor); posted speed limit; angle of vehicle impact; and aesthetics when designing the Type "G" Modified End Terminal.

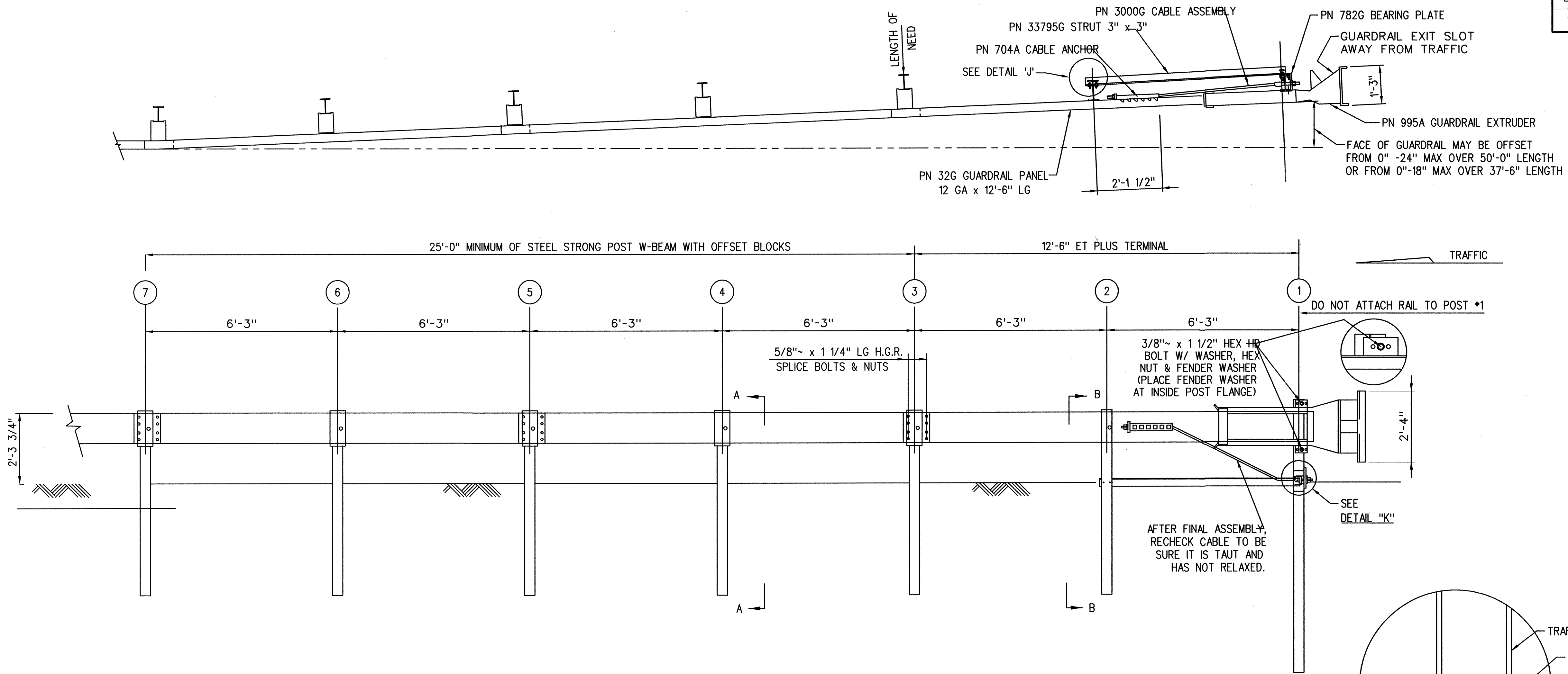
During construction, the Contractor shall layout the proposed Type "G" Modified End Terminal and receive approval from the Construction Engineer prior to installation.

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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION GUARDRAIL DETAILS KALANIANA'OLE HIGHWAY RESURFACING West Hind Drive to Vicinity of Hanauma Bay Road Federal Aid Project No. NH-072-1(056) Scale: NTS Date: August, 2013 SHEET No. 4 OF 5 SHEETS
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-072-1(056)	2013	23	85

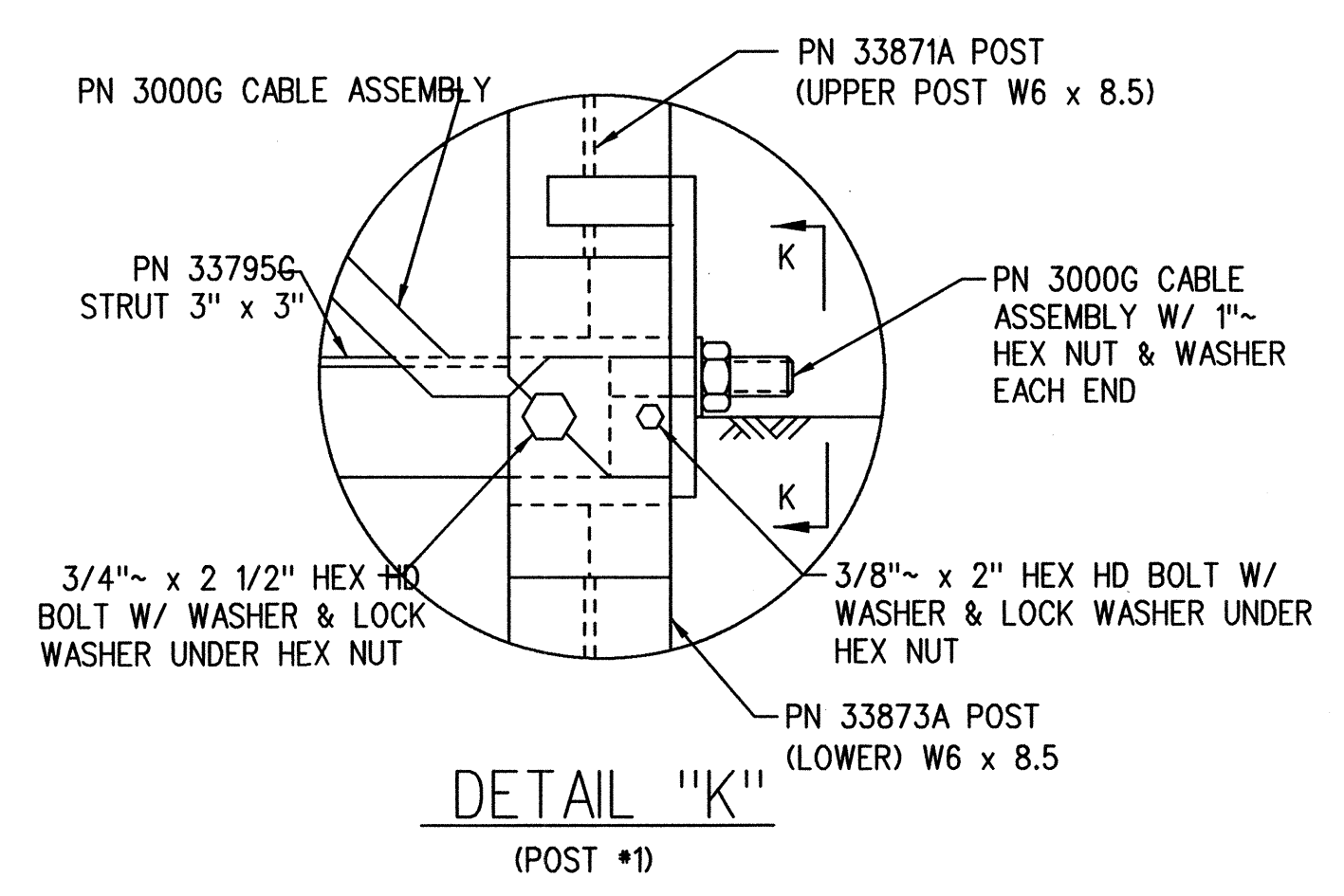
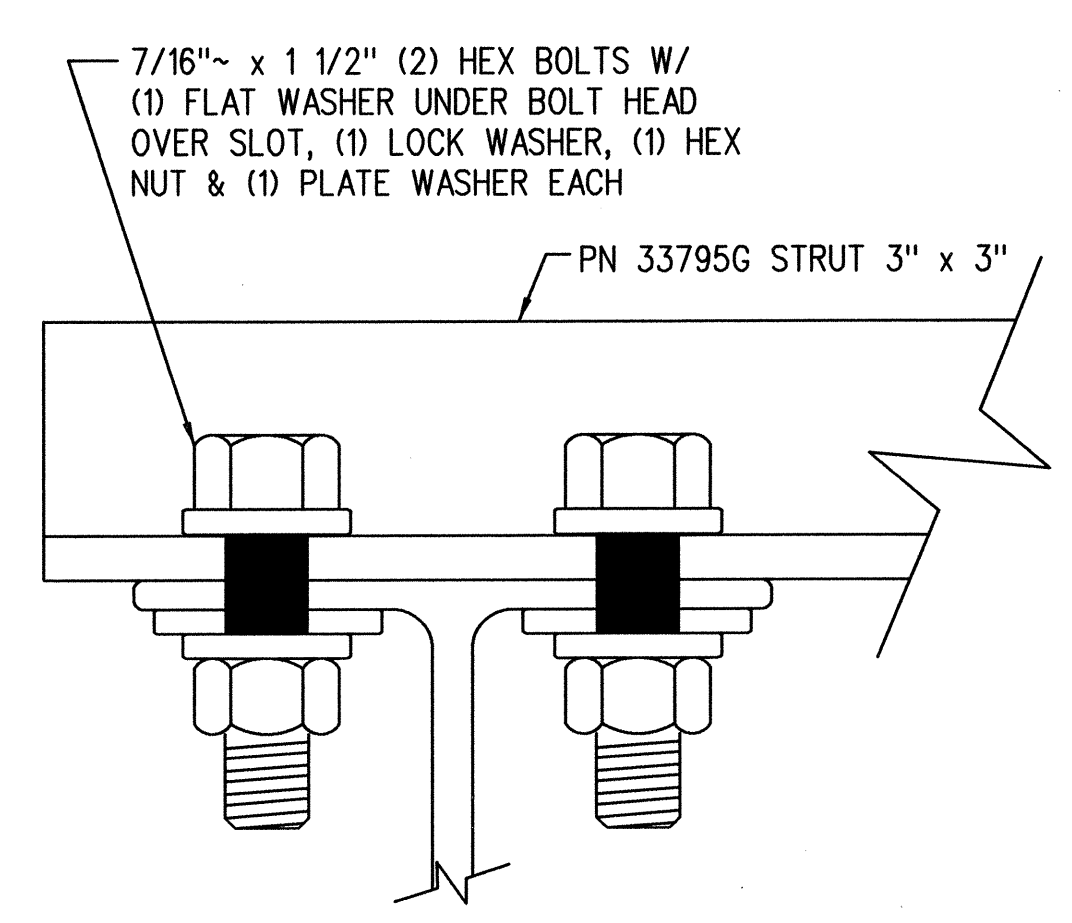
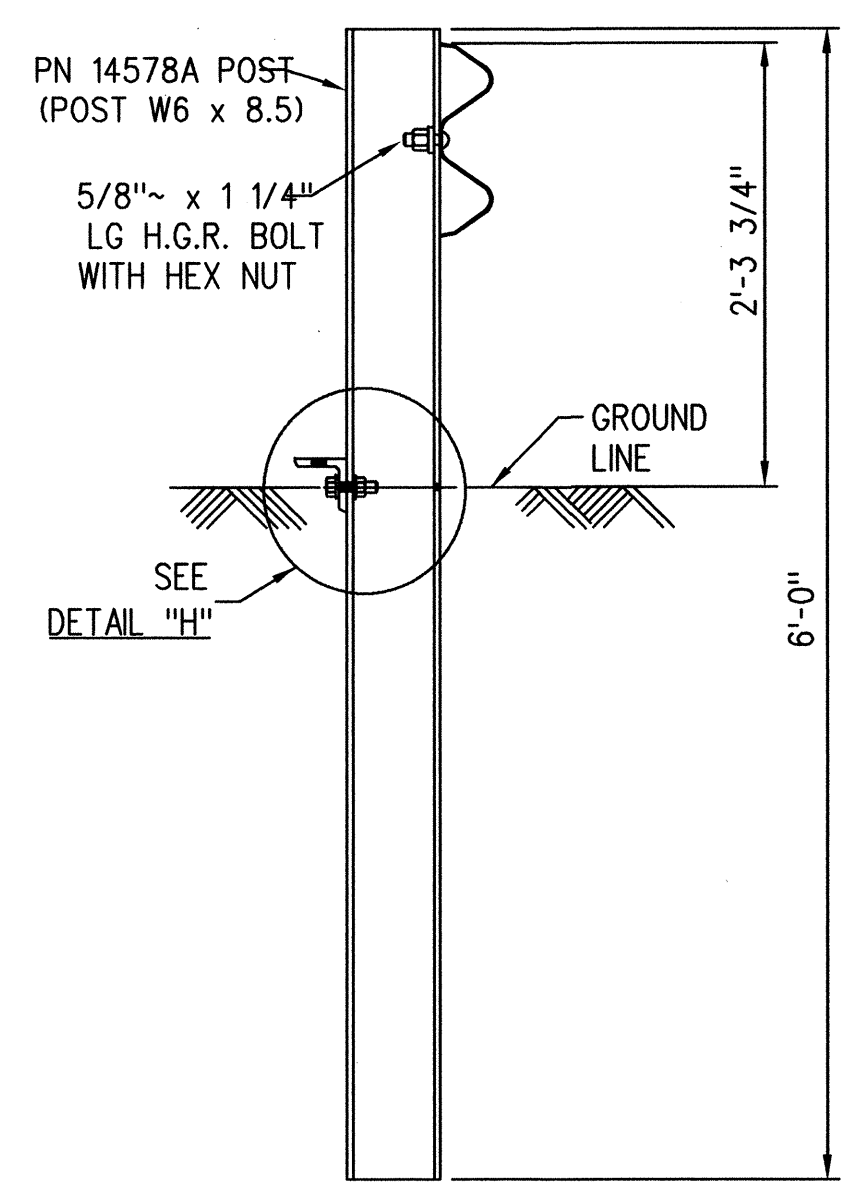
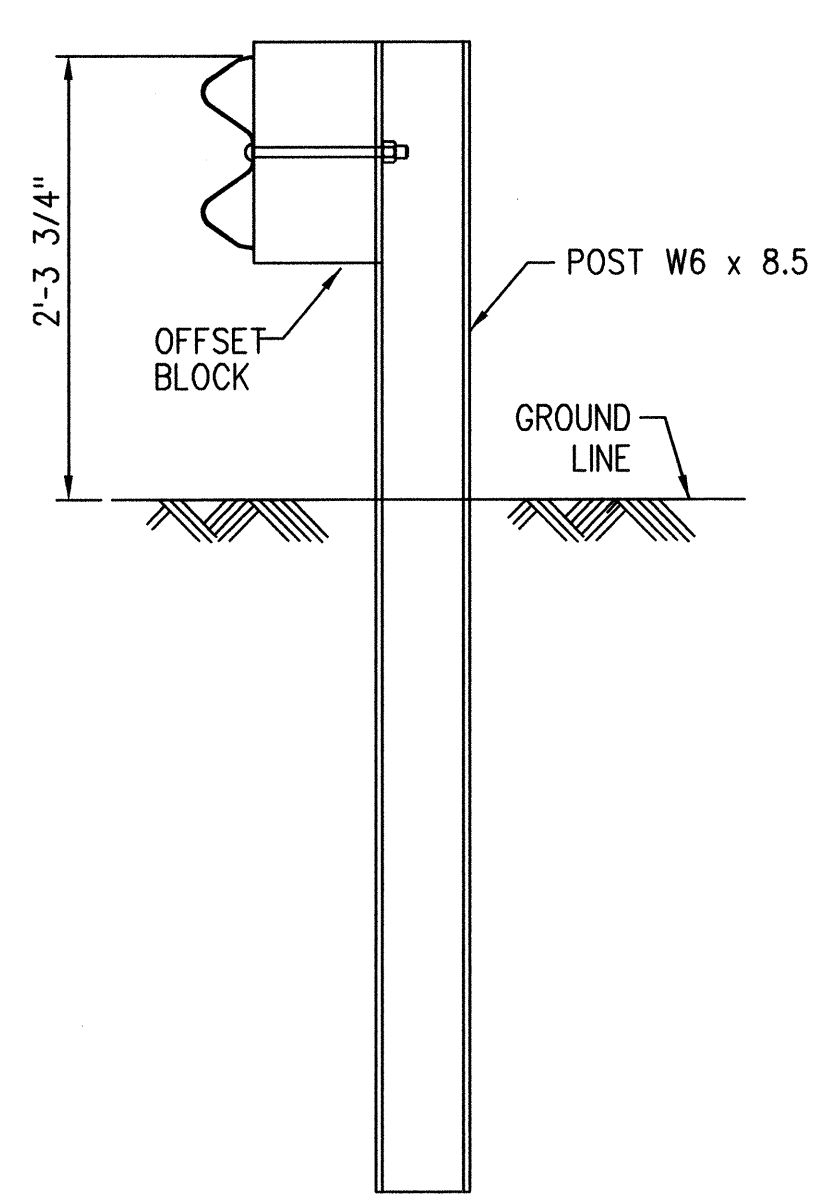
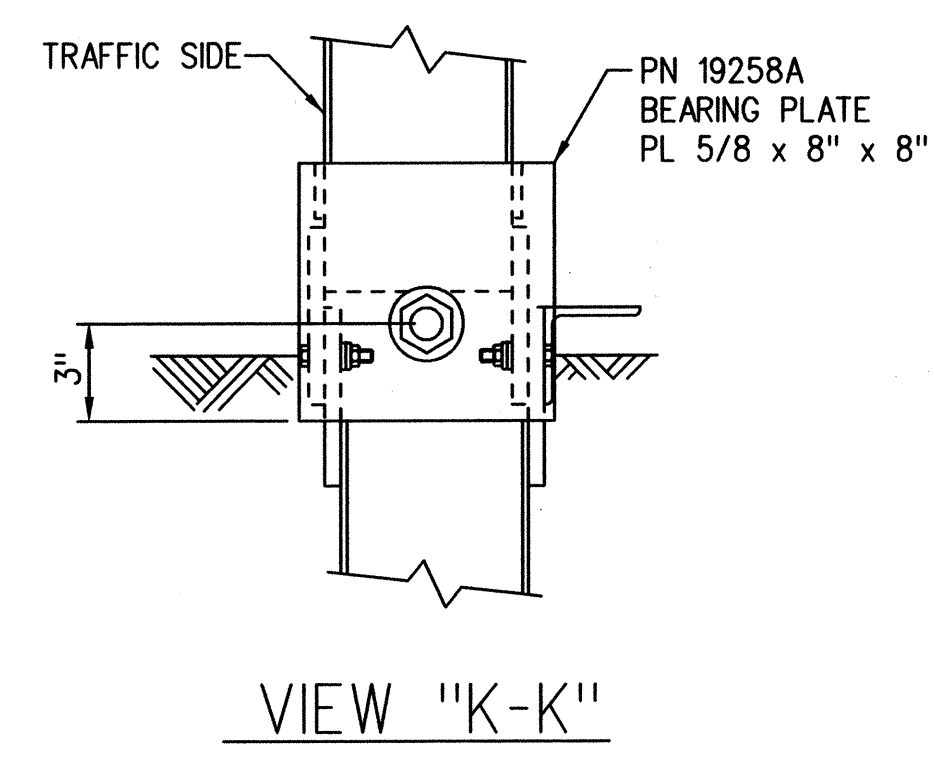
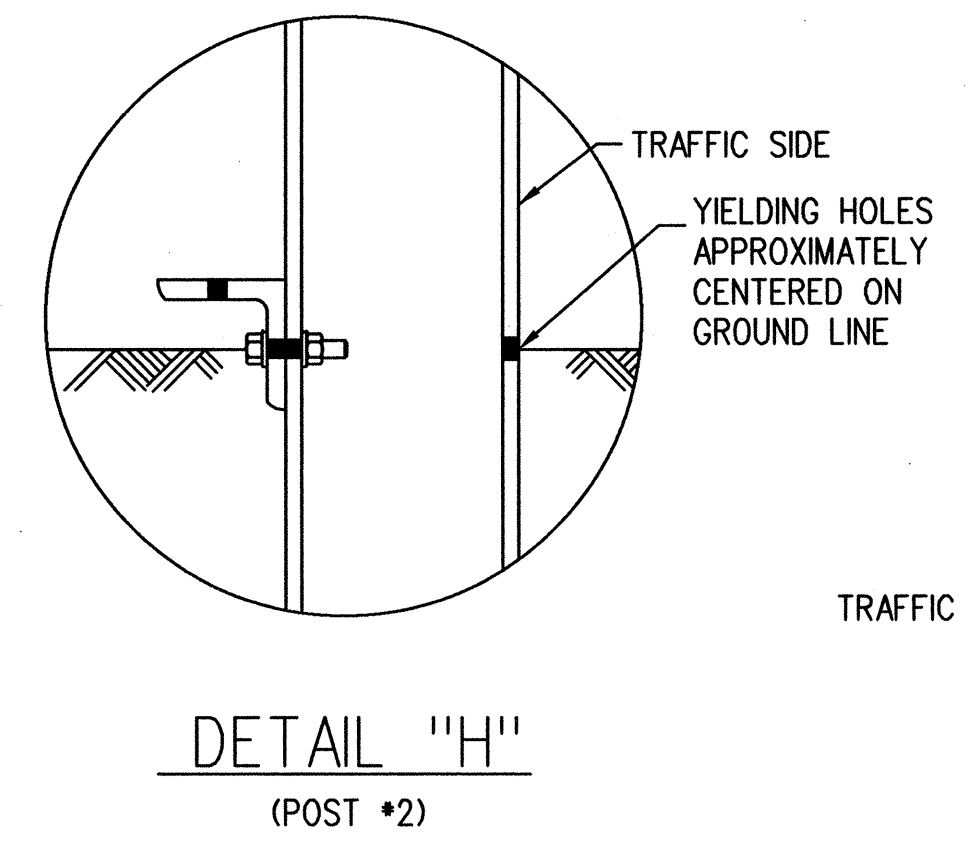
BILL OF MATERIAL		
PN	QTY	DESCRIPTION
32G	1	12/12'-6/8'3/S ANC (GUARDRAIL)
704A	1	CABLE ANCHOR BRACKET
995A	1	ET-PLUS EXTRUDER
3000G	1	CABLE 3/4" x 6'6"
3340G	9	5/8" HEX NUT
3360G	9	5/8"~ x 1 1/4" SPLICE BOLT
3701G	2	3/4" FLAT WASHER
3704G	2	3/4" HEX NUT
3717G	2	3/4"~ x 2 1/2" HEX HD BOLT
3900G	2	1" FLAT WASHER
3910G	2	1" HEX NUT
4254G	4	3/8" FLAT WASHER
4255G	2	3/8" FENDER WASHER (1 1/2" OD)
4258G	2	3/8" LOCKWASHER
4261G	2	3/8"~ x 1 1/2" HEX HD BOLT
4389G	2	7/16" FLAT WASHER
4390G	2	7/16"~ x 1 1/2" HEX HD BOLT
4393G	2	7/16" LOCK WASHER
4396G	2	7/16" HEX NUT
4699G	2	3/4" LOCK WASHER
6321G	2	3/8"~ x 2" HEX HD BOLT
6405G	4	3/8" HEX NUT
6668B	1	OBJECT MARKER
14578G	1	POST SYT #2
19258A	1	5/8" x 8" x 8" BEARING PLATE
33795G	1	ANGLE STRUT (ET/SYTP/HBA)
33871A	1	POST ET PLUS HBA #1 TOP
33873A	1	POST ET PLUS HBA #1 BOTTOM



NOTE: Do not attach guardrail to Post #1.

Object Marker Note:

The stripes for Object Marker shall slope downward at an angle of 45° towards the sides of the extruder head where traffic is to pass.



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NOTE BOOK	
DATE	
BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ET-PLUS (TL-3)
KALANIANA'OLE HIGHWAY RESURFACING
West Hind Drive to
Vicinity of Hanauma Bay Road
Federal Aid Project No. NH-072-1(056)
Scale: NTS Date: August, 2013
SHEET No. 5 OF 5 SHEETS